

1           1.       In a computer system including a processing unit, a hardware graphics unit,  
2       and a display device for displaying an image, the hardware graphics unit capable of  
3       responding to function calls received via an application program interface, the display  
4       device having a plurality of pixels, at least some of the plurality of pixels including a  
5       plurality of pixel sub-components each of a different color, a method for rendering sub-  
6       component-oriented characters within the displayed image using the hardware graphics  
7       unit, the method comprising the following:

8               an act of generating a bit-map representation of a sub-component-oriented character  
9       by using a sample to generate each pixel sub-component; and

10              an act of rendering the sub-component-oriented character on the display device by  
11       making one or more function calls to the hardware graphics unit using the application  
12       program interface.

13  
14           2.       A method in accordance with Claim 1, wherein the act of rendering the sub-  
15       component-oriented character on the display device comprises the following:

16              an act of blending the sub-component-oriented character on a background by  
17       making one or more function calls to the hardware graphics unit.

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19           3.       A method in accordance with Claim 2, wherein the act of blending the sub-  
20       component-oriented character on the display device comprises the following:

21              an act of blending the sub-component-oriented character on a non-solid background  
22       image by making one or more function calls to the hardware graphics unit.

1           4.       A method in accordance with Claim 2, wherein the act of blending the sub-  
2 component-oriented character comprises the following:

3           an act of blending the sub-component-oriented character on a background using a  
4 semi-transparent brush by making one or more function calls to the hardware graphics unit.  
5

6           5.       A method in accordance with Claim 1, wherein the act of rendering the sub-  
7 component-oriented character on the display device comprises the following:

8           an act of rotating the sub-component-oriented character on a background by  
9 making one or more function calls to the hardware graphics unit.  
10

11          6.       A method in accordance with Claim 1, wherein the act of rendering the sub-  
12 component-oriented character on the display device comprises the following:

13          an act of scaling the sub-component-oriented character on a background by making  
14 one or more function calls to the hardware graphics unit.  
15

16          7.       A method in accordance with Claim 1, wherein the act of rendering the sub-  
17 component-oriented character on the display device comprises the following:

18          an act of rendering the sub-component-oriented character on the display device by  
19 making one or more function calls that are compatible with DirectX.  
20

21          8.       A method in accordance with Claim 1, wherein the Application Program  
22 Interface is configured to treat each pixel as a single luminance intensity source, rather  
23 than treating each pixel sub-component as a single luminance intensity source.  
24

1           9.     A method in accordance with Claim 8, wherein the method further  
2 comprises the following:

3           an act of processing the sub-component-oriented character to interface with the  
4 Application Program Interface.

5  
6           10.    A method in accordance with Claim 9, wherein the act of rendering the sub-  
7 component-oriented character on the display device comprises the following:

8           an act of defining a color channel for each pixel sub-component type; and

9           an act of separately populating a distinct color buffer for each color channel.

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1           11. A computer program product for use in a computer system that includes a  
2 processing unit, a hardware graphics unit, and a display device for displaying an image, the  
3 hardware graphics unit capable of responding to function calls received via an application  
4 program interface, the display device having a plurality of pixels, at least some of the  
5 plurality of pixels including a plurality of pixel sub-components each of a different color,  
6 the computer program product for implementing a method for rendering sub-component-  
7 oriented characters within the displayed image using the hardware graphics unit, the  
8 computer program product comprising one or more computer-readable media having  
9 stored thereon the following:

10           computer-executable instructions for generating a bit-map representation of a sub-  
11 component-oriented character by treating each pixel sub-component as a distinct  
12 luminance intensity source; and

13           computer-executable instructions for making one or more function calls to the  
14 hardware graphics unit using the application program interface, the function calls  
15 configured to cause the hardware graphics unit to render the sub-component-oriented  
16 character on the display device.

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18           12. A computer program product in accordance with Claim 11, wherein the one  
19 or more computer-readable media are physical storage media.

20  
21           13. A computer program product in accordance with Claim 11, wherein the  
22 computer-executable instructions for making one or more function calls to the hardware  
23 graphics unit comprise the following:

1 computer-executable instructions for making one or more function calls to the  
2 hardware graphics unit that cause the hardware graphics unit to blend the sub-component-  
3 oriented character on a background.

4  
5 14. A computer program product in accordance with Claim 13, wherein the  
6 computer-executable instructions for making one or more function calls to the hardware  
7 graphics unit that cause the hardware graphics unit to blend the sub-component-oriented  
8 character on a background comprise the following:

9 computer-executable instructions for making one or more function calls to the  
10 hardware graphics unit that cause the hardware graphics unit to blend the sub-component-  
11 oriented character on a non-solid image background.

12  
13 15. A computer program product in accordance with Claim 13, wherein the  
14 computer-executable instructions for making one or more function calls to the hardware  
15 graphics unit that cause the hardware graphics unit to blend the sub-component-oriented  
16 character on a background comprise the following:

17 computer-executable instructions for making one or more function calls to the  
18 hardware graphics unit that cause the hardware graphics unit to blend the sub-component-  
19 oriented character on a background using a semi-transparent brush.

20  
21 16. A computer program product in accordance with Claim 11, wherein the  
22 computer-executable instructions for making one or more function calls to the hardware  
23 graphics unit comprise the following:

1 computer-executable instructions for making one or more function calls to the  
2 hardware graphics unit that cause the hardware graphics unit to rotate the sub-component-  
3 oriented character on a background.

4  
5 17. A computer program product in accordance with Claim 11, wherein the  
6 computer-executable instructions for making one or more function calls to the hardware  
7 graphics unit comprise the following:

8 computer-executable instructions for making one or more function calls to the  
9 hardware graphics unit that cause the hardware graphics unit to scale the sub-component-  
10 oriented character on a background.

11  
12 18. A computer program product in accordance with Claim 11, wherein the  
13 computer-executable instructions for making one or more function calls to the hardware  
14 graphics unit comprise the following:

15 computer-executable instructions for making one or more function calls to the  
16 hardware graphics unit using DirectX.

17  
18 19. A computer program product in accordance with Claim 11, wherein the  
19 computer-executable instructions for making one or more function calls to the hardware  
20 graphics unit comprise the following:

21 computer-executable instructions for processing the sub-component-oriented  
22 character to interface with the Application Program Interface.

1           20.    A computer program product in accordance with Claim 11, wherein the  
2 computer-executable instructions for making one or more function calls to the hardware  
3 graphics unit comprise the following:

4           computer-executable instructions for defining a color channel for each pixel sub-  
5 component type; and

6           computer-executable instructions for separately populating a distinct color buffer  
7 for each color channel.

8  
9           21.    A computer program product in accordance with Claim 11, wherein the  
10 computer-executable instructions for making one or more function calls comprise the  
11 following:

12           computer-executable instructions for providing an inter-pixel interpolation of glyph  
13 data by means of graphics hardware.

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1     22.     A computer system comprising the following:  
2             a processing unit;  
3             a hardware graphics unit configured to respond to function calls via an application  
4     program interface;  
5             a display device for displaying an image and having a plurality of pixels, at least  
6     some of the plurality of pixels including a plurality of pixel sub-components each of a  
7     different color; and  
8             one or more computer-readable media having computer-executable instructions  
9     stored thereon that, when executed by the processing unit, are configured to instantiate the  
10    following:  
11             a scaling unit configured to overscale a character representation;  
12             a scan conversion unit configured to place the overscaled character  
13     representation on a grid, and configured to assign at least a luminance intensity  
14     value to each grid position based on the properties of the overscaled character  
15     representation at that grid position, wherein each grid position corresponds to a  
16     particular pixel sub-component, wherein each pixel sub-component of the  
17     overscaled character representation corresponds to one or more grid positions; and  
18             an adaptation module configured to make one or more function calls to the  
19     hardware graphics unit through the application program interface using at least the  
20     luminance intensity values assigned to each grid position to cause the hardware  
21     graphics unit to render the character represented by the character representation.